

# **Environmental Assessment**

## **Hazard Fuel Reduction & Site Restoration Sequoia & Kings Canyon National Parks East Fork Kaweah Developed Areas Oriole Lake and Silver City**



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National Park Service  
Sequoia & Kings Canyon National Parks  
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## Summary

This assessment discusses a proposal for conducting fuel hazard reduction and ecological restoration on National Park Service (NPS) lands adjacent to several developed areas. The project would allow for safer reintroduction of fire into surrounding wildlands and wilderness, and directly restore the project sites to more natural ecological function and structure.

The work would consist of prescribed burning, or mechanically removing, chipping, and/or piling and burning various dead and living fuels on two sites located in the East Fork of the Kaweah River (Mineral King) drainage where fuels have accumulated during 100 years of fire suppression. The history of fire suppression in these areas has result in a forest structure and fuel load that is outside the range of natural conditions. These fuel conditions also constitute an imminent hazard to structures and their occupants.

The proposed work would restore the project those sites to more natural fuel load and forest structure while creating a reduced fuel environment between the developments and extensive NPS wildlands and wilderness surrounding the developments. The reduced fuel areas would facilitate the proactive implementation of the parks fire management objectives of restoring fire to the surrounding ecosystem and providing for public and firefighter safety.

Three alternatives are explored in this assessment:

- A. No Action - allow fuels to continue to accumulate untreated
- B. Mechanical Treatment (Preferred Alternative) - reduce fuels using mechanical methods and pile burning, and
- C. Prescribed Fire - applying prescribed fire alone to reduce fuels.

Under alternatives B and C, the maximum width of the project areas would be 200 feet. Under Alternative B - Mechanical Treatment, all mature conifer trees (those over 40 feet in height) and all hardwood trees (primarily black oak) within the project areas would remain. Twenty-five smaller conifer trees per acre would also be left. Dead and down logs over 8 inches in diameter would be preserved in situ for habitat. Some dense shrub patches would be thinned or broken up in areal extent to slow the spread of fire.

Under Alternative C - Prescribed Fire, the project sites would be prescribed burned. The resulting fuel and tree mosaic would be more varied and less deterministic than the mechanical treatment. Some larger down logs would probably remain. Due to the high fuel loads in the project area and their close proximity to private structures, the prescribed fire alternative has an inherently higher risk in implementation. Since it would result in a more varied and natural appearing stand structure, Alternative C would also have a less certain outcome than the mechanical alternative in meeting hazard fuel reduction objectives.

Under both treatment options, due to the small size of the project areas and their context between developed areas and extensive wildlands, the proposed work is not expected to have significant impacts to park resources or the visitor experience. The project site at Oriole Lake may involve several acres of designated wilderness directly adjacent to the developments. While minor and short term impacts may occur to the wilderness resource during project implementation, the project would provide long term benefit to the involved and adjacent wilderness by facilitating the proactive restoration of a natural fire regime and conditions across a large area.

Alternative B. - Create Reduced Fuel Buffer through Mechanical Means, is the preferred alternative and the environmentally preferred alternative. No impairment of park resources would occur as a result of this action.

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## **Purpose and Need**

Due to extensive fire suppression over the past century, dead and down fuels continue to accumulate in the forests of the East Fork of the Kaweah River. Dense thickets of small trees and shrubs that would have been kept in check by frequent natural fires contribute additional significant risk.

Two developments containing private lands and structures, Oriole Lake and Silver City, are fully surrounded by NPS lands. Many of the private landowners have worked to reduce hazardous levels of fuels in and adjacent to their buildings and within property lines. The efforts on the private lands are, in some cases, inadequate for providing defensible space in the event of a wildfire due to the extreme fuel load on adjacent NPS lands. The NPS has been working over the past six years to reintroduce fire to the East Fork as a way to restore and maintain ecosystem function as well as to reduce hazardous levels of fuels. To continue to implement the prescribed fire program while buffering the private lands from wildfire, the park proposes to create reduced fuel zones at strategic points around those developments. The zones would be used by the NPS as anchor points to implement prescribed fire projects outward onto adjacent wildlands.

## **Issue Scoping**

Public scoping for the Fire and Fuels Management Plan revision was conducted over the past two years at a series of five public meetings. Three internal scoping meetings have been held with park staff. These sessions indicate strong public support for actions that lead to better fire protection for park communities and developments, as well for actions leading to the restoration of more natural resource condition and function. The actions proposed in this EA respond to recent comments received from the affected communities and landowners including the Silver City cabin owners association. Further outreach regarding the specific actions proposed in this document was conducted with Oriole Lake and Silver City landowners. All landowners contacted support the proposed actions.

## **Alternatives**

### ***A. No Action – Allow Fuels to Accumulate***

The no action alternative would continue the current practice of allowing fuels and tree densities to increase on parklands adjacent to private lands and structures. Private landowners would be responsible for maintaining fire-safe clearances around structures on non-NPS lands under this and all other alternatives.

### ***B. Create Reduced Fuel Buffer through Mechanical Means***

This alternative would create 200' wide reduced fuel zones at strategic areas around the two developments. Work would consist of hand clearing and removing, chipping, and/or or piling and burning surplus fuels. All larger trees and a number of smaller trees would remain within the

buffer, as would all dead and down logs greater than 8 inches in diameter (see Appendix A for specific work standards and treatment prescription). This alternative could be implemented using park staff or a private contractor. Retreatment of the area every 3-15 years would be required to maintain effectiveness of the treatment.

### ***C. Create Reduced Fuel Buffer using Prescribed Fire***

Alternative C would reduce fuel accumulations through conservative prescribed burning. Due to the extremely high fuel concentrations immediately adjacent to some developments, extreme care and narrow prescription windows would be required for safe implementation. This alternative would be implemented using park staff experienced at burning in these fuel types. Monitoring results from past burns in this type of forest and fuel condition indicate that fuel levels can be successfully reduced to more natural levels through prescribed burning (Keifer et al, 2000). Retreatment of the area every 3-15 years would be required to maintain effectiveness of the buffer.

### ***Environmentally Preferred Alternative***

Alternative B is the environmentally preferred alternative. It allows park managers to perform needed ecological restoration while providing a high level of protection to park visitors, private lands, and structures. The results of the project will allow more aggressive restoration of fire to a large portion of NPS wildlands while minimizing risk. The reduced fuel zone will provide an aesthetic and ecologically functional transition between the privately owned developed areas and other NPS managed wildlands.

## **Affected Environment**

The East Fork is one of five major drainages comprising the Kaweah River watershed that flows west into the Tulare Lake Basin in the southern Central Valley. Terrain in the watershed is rugged, with elevations ranging from 874 m (2,884 ft) to 3,767 m (12,432 ft). The watershed is 21,202 ha (52,369 ac) in size, and bounded by Paradise Ridge to the north, the Great Western Divide to the east, and Salt Creek Ridge to the south. Major topographic features of the watershed include the high elevation Mineral King Valley, Hockett Plateau, Horse Creek, the high peaks comprising the Great Western Divide, and the Oriole Lake subdrainage (with an unusually low elevation lake for the Sierras at 1,700 m elevation).

Vegetation of the area is diverse, varying from foothills chaparral and hardwood forest at lower elevations to alpine vegetation at elevations above 10-11,000 feet. About 80% of the watershed is vegetated with most of the remainder rock outcrops located on steep slopes and at high elevations. Vegetation in the drainage is dominated by red and white fir forest with pine and foothill types of somewhat lesser importance. Grasslands and oak woodland, while common at low elevations in the Kaweah drainage, are uncommon within the park's portion of the East Fork watershed. Sequoia groves within the drainage include Atwell, East Fork, Eden, Oriole Lake, Squirrel Creek, New Oriole Lake, Redwood Creek, Coffeepot Canyon, Cahoon Creek, and Horse Creek. None of the proposed treatments in this environmental assessment (EA) would occur in

sequoia groves. No endangered species are known from the project area although several sensitive species have been located during surveys (Norris and Brennan 1982).

Access to the area is limited to the narrow winding Mineral King Road, 25 miles long. The Mineral King Valley is popular with backpackers and stock users as a starting point for many high country trips. Higher elevations of the watershed receive considerable recreation use while lower elevations receive relatively little use. Developed or semi-developed areas within the watershed include Silver City and Kaweah Han (private lands), Oriole Lake (private lands), Cabin Cove, Mineral King, Faculty Flat (lease cabin sites), Lookout Point, and the Atwell Mill areas (administrative sites). NPS campgrounds exist at Atwell Mill and Mineral King.

Portions of the drainage are included in a proposed cultural landscape eligible for listing in the National Register of Historic Places. The Mineral King Road and some associated sites such as the Atwell Ranger Station are primary features of this landscape. The work proposed in this EA intersects the historic road corridor at Silver City. The remaining actions fall outside the boundaries of National Register designation. A number of other historic and pre-historic cultural resources also exist in the drainage.

Fire fuels in the Oriole Lake portion of the project have been found to be some of the highest in the park, far exceeding natural fuel loads (NPS internal report, 1989). Historical fire records show that there have been at least 30 fires suppressed by the park within two miles of Oriole Lake since 1921. Many of the ignitions were from lightning fires, though others were human caused with origins along the Mineral King road. The combination of high fuel levels and frequent ignition sources create a situation conducive to high-risk fire events. The narrow road that provides access to the development does not provide ready defense, nor would it provide a safe evacuation route in case of fire in the vicinity. In case of fire, developments in this area need to be defensible without benefit of significant firefighting forces.

Much of the Oriole Lake project area was logged over prior to being acquired by the NPS in the mid 1970's leaving much of the area in dense second growth. The 1986 Land Protection Plan for the area (revised in 1991) states that "[t]he management objective for Oriole Lake is to restore the area to natural conditions and add it to the designated wilderness of these Parks. Elimination of the residential uses of the area will readily allow natural regeneration of native vegetation and wildlife and allow for reintroduction of fire." The NPS-acquired holdings include numerous logging roads, skid trails, cabin sites, and a 1,000 foot-long runway. The remaining private properties have not been acquired leaving a checkerboard of NPS and privately held lands.

Portions of the Oriole Lake project area may occur in designated wilderness. Some of the old developments such as the runway, logging roads, and rights-of-way to privately owned parcels might also be located in wilderness. The exact wilderness boundary around the Oriole Lake developments has not been surveyed and is approximate at this time. Therefore, this assessment is based on a conservative wilderness boundary, and treats areas where the boundary location is uncertain as defacto wilderness. The proposed project would result in the restoration of more natural conditions and enhance wilderness values per objectives contained in the Land Protection Plan.



Though the Silver City project area has lower overall fuel loads than Oriole Lake, fuel loads are still higher than natural levels. High fuel loads, steep slopes immediately below the developments, combined with potential ignitions from lightning and from human sources including the privately owned Kaweah Han and other recreational use along the river, create a hazardous fire situation. Few firefighting resources in the immediate area, combined with difficult and slow access for incoming firefighting resources, indicate a strong need to have adequate buffering around the developments to preserve life safety in the area and to minimize the loss of structures in the event of a fire.

## **Impacts**

### ***Public and Firefighter Safety***

#### *NPS Policy:*

“...park fire management programs will be designed to meet park resource management objectives while ensuring that firefighter and public safety are not compromised.” (Management Policies 2001, section 4.5)

#### *Methodology:*

Estimating resistance to control is the primary consideration in determining the relative risk to firefighter and public safety. Under a given set of environmental conditions, light fine fuel loads and a well spaced overstory tree canopy produce less intense and more controllable fire behavior, hence less risk. Conversely, heavy fine fuel loads along with a dense, closed canopy overstory create conditions for less controllable and more extreme fire behavior. The analysis of risk below is based on the pre treatment and post treatment fuel and canopy conditions quantitatively described in the appendices.

#### *A. No Action – Allow Fuels to Accumulate*

**Public –** Public safety, specifically residents of the private structures and park visitors lodging at the Silver City Resort, would continue to be at significant risk should a wildfire event approach the developments from below. Some measure of protection would be afforded by past fuel clearance work on private lands. However untreated fuels on the NPS side of the property line may create high intensity fire behavior that would overcome the protection offered by the limited clearance on private lands. Evacuating visitors and residents would be the highest priority in case of fire.

**Firefighter –** Firefighter safety would be high priority and would be stressed through adherence to the standard firefighting orders and the use of full personal protective equipment at all times. The limited access and high fuel loads in close proximity to developments would render most wildland firefighting tactics ineffective in protecting structures under moderate to high fire behavior conditions. The primary function of firefighting efforts would be to evacuate visitors and residents, and check the spread of fire as possible given firefighter safety considerations.

### *B. Create Reduced Fuel Buffer through Mechanical Means*

Public – Public safety would be significantly increased through the creation of a defensible zone around developments in conjunction with efforts on private lands. Evacuating visitors and residents would be the highest priority in case of fire, in conjunction with holding actions within the defensible buffer. Under high to extreme fire conditions, the proposed buffer may be inadequate to contain unwanted fires, but may decrease the intensity around developments allowing more opportunity for survival and escape.

Implementation of the reduced fuel buffers would be carefully planned and conducted with full consideration for public safety in mind. Trees and snags removed would be felled away from private property and structures.

Firefighter – Firefighter safety would be high priority and would be stressed through adherence to the standard firefighting orders and the use of full personal protective equipment at all times. Fire intensity within the reduced fuel buffer would allow the use of standard wildland firefighting practices. Such practices may be effective in slowing or halting the spread of unwanted fire under normal conditions. Extreme fire conditions may still render the buffer ineffective.

Implementation of the reduced fuel buffers would entail some risk to firefighters or contractors as a result of the use of power saws, felling trees, and related hazards. A job hazard analysis would be conducted prior to any work, and all usual and customary safety practices would be implemented to insure safety of workers.

### *C. Create Reduced Fuel Buffer using Prescribed Fire*

Public – Impacts would be similar to Alternative B. There would be additional risk to developments and visitors as a result of the use of prescribed fire in heavy fuels immediately adjacent to structures and private holdings. Pre-planning and positioning of control lines and equipment, combined with the use of conservative burn prescriptions (conditions under which the burn operations would be conducted) would significantly reduce risk to public safety and structures. Once successfully implemented the reduced fuel conditions would provide an increased level of defensible space than current conditions though with less certain outcomes than Alternative A.

Firefighter – Similar to Alternative B with the additional risk to firefighters that may occur from falling embers, snags, and other usual hazards in the fire environment. Firefighter safety would be high priority and would be stressed through adherence to the standard firefighting orders and the use of full personal protective equipment at all times.

### *Conclusions*

Alternative A – No Action, would result in increasing risk for both public and firefighter safety in the event of a wildfire. Treatment Alternatives B and C would both result in significantly decreased risk and increased protection for public and firefighter safety in the event of fire. Implementation of Alternative C has slightly greater risk to safety and infrastructure protection due to its use of fire as the tool of choice.

## ***Ecological Function***

### *NPS Policy:*

“Natural resources will be managed to preserve fundamental physical and biological processes...”

“Biological or physical processes altered in the past by human activities may need to be actively managed to restore them to a natural condition or to maintain the closest approximation of the natural condition in situations in which a truly natural system is no longer attainable.”  
(Management Policies 2001, section 4.1)

### *Methodology:*

The park has developed ecological function and structural restoration objectives for most of the parks forest types. These objectives are incorporated into several scientific papers including Keifer et al (2000). The determination of how each alternative would affect ecological function was arrived at by assessing how effectively the alternatives create conditions consistent with desired function and structure.

#### *A. No Action – Allow Fuels to Accumulate*

The project areas are in an ecologically compromised state due to unnatural fuel loads and tree density. Perpetuating these conditions will result in further degradation and alteration to natural function. However, since the project areas are directly adjacent to already developed and altered private lands where ecosystem function is not a primary objective, the level of additional impact of the buffer areas on overall ecosystem function is slight. Of greater importance to ecosystem function is the limitation that the high fuel loads adjacent to developments place on larger ecosystem restoration goals for surrounding NPS lands. While unsafe fuel conditions exist around and adjacent to developments, implementation of prescribed burning to restore the natural role and function of fire over a larger area will be restrained.

#### *B. Create Reduced Fuel Buffer through Mechanical Means*

The specifications for the reduced fuel buffer would result in a fuel and forest canopy condition closely resembling those desired for restoring natural conditions (Keifer et al 2000). The project areas would more closely resemble natural conditions than at present, though the results would be specific, deterministic, and less variable in mosaic and composition than those resulting from purely natural processes. The creation of a defensible buffer is critical to future implementation of more widespread restoration of fire as an ecosystem process on adjacent NPS lands.

#### *C. Create Reduced Fuel Buffer using Prescribed Fire*

The results of a prescribed burn would result in a reduced fuel buffer and a fuel and forest canopy condition closely resembling those desired for restoring natural conditions (Keifer et al 2000). The project areas would more closely resemble natural conditions than at present, though the actual outcome is less deterministic, therefore may not fully meet all reduced tree density and fuel conditions desired for fire protection within the buffer.

## ***Conclusions/Impairment***

Alternative A continues impairment of the resources by allowing conditions of unnatural fuel and tree density to persist. Further resource impairment could occur under that alternative as a result of unnaturally hot fires burning through these sites under wildfire conditions. Alternatives B and C both restore local fuel load and tree densities to more natural conditions. While Alternative A would result in continued impairment, both Alternatives B and C would reduce impairment and allow more natural ecosystem function.

## *Aesthetics*

### *NPS Policy:*

There are no specific laws or policies that guide or require preservation of a specific aesthetic character except as defined under cultural resource preservation standards for historic landscapes or scenes (see the Cultural Resource section of this document). However, as the proposed projects are in and adjacent to private property and public recreation areas, the intent is to conduct work in such a way that property values, residents, and visitor experiences are not negatively impacted.

### *Methodology:*

Since aesthetic character is extremely subjective, the analysis relies heavily on a social science study conducted in the parks that evaluated the public's perceptions of the effects of prescribed fire (Quinn, 1987). That study showed broad acceptance of the aesthetic conditions created by fire events. Both action alternatives (B and C) would create conditions similar to those created by natural or prescribed fire events.

#### *A. No Action – Allow Fuels to Accumulate*

High fuel levels and abnormally high densities of small trees serve as visual buffers between NPS and private lands. Some visitors and residents may value these visual buffers as attractive or aesthetically pleasing. This alternative would continue these conditions. In the event of a wildfire, the added fuels may cause long term negative change to the aesthetics of the project area through higher than natural mortality to overstory trees.

#### *B. Create Reduced Fuel Buffer through Mechanical Means*

High fuel levels and dense thickets of trees would be reduced to levels that are more natural. These conditions reduce visual buffers between NPS and private lands, but create a more open understory, a condition that is also attractive to many residents and visitors. The developed areas would blend more seamlessly into the natural environment than conditions that would persist under Alternative A. Some flush cut stumps may be visible for several years.

#### *C. Create Reduced Fuel Buffer using Prescribed Fire*

High fuel levels and dense thickets of trees would be reduced to levels that are more natural. These conditions reduce visual buffers between NPS and private lands, but create a more open understory, a condition that is also attractive to many residents and visitors. The developed areas would blend more seamlessly into the natural environment than conditions that would persist under Alternative A. Ash from fire and scorched trees and vegetation would persist for several

years in the project area. Wildflowers and other forbs may be more abundant in years immediately following fire.

#### *Conclusions/Impairment*

Alternative A would perpetuate dense visual buffers between NPS and private lands. Alternatives B and C would create a more open understory in the project area. They would create a more natural transition in appearance between the developed areas and NPS wildlands. Alternative C would have evidence of the fire event for a number of years following the treatment. As aesthetic values differ among visitors and residents, each alternative has the potential to increase or decrease visual aesthetics. Silver City and Oriole Lake residents and landowners, having seen and lived with the aesthetic effects of prescribed fire on nearby parklands, overwhelmingly support implementation of the action alternatives. Private landowners in these areas generally support the creation of reduced fuel buffers (Silver City Service Club, 1999). No impairment of the aesthetic character of the area is expected under the proposed alternative.

#### *Special Status Species*

##### *NPS Policy:*

“The service will survey for, protect, and strive to recover all species native to national park system units that are listed under the Endangered Species Act.” (Management Policies 2001, section 4.4.2.3)

##### *Methodology:*

A list of potential special status species was obtained from the US Fish and Wildlife Service. Park subject matter experts were consulted to assess the listing and draw conclusions regarding the effect of the proposed actions on these species.

##### *A. No Action – Allow Fuels to Accumulate*

No special status species, including threatened or endangered species or their critical habitats, are known to occur on the project sites.

##### *B. Create Reduced Fuel Buffer through Mechanical Means*

No special status species, including threatened or endangered species or their critical habitats, are known to occur on the project sites.

##### *C. Create Reduced Fuel Buffer using Prescribed Fire*

No special status species, including threatened or endangered species or their critical habitats, are known to occur on the project sites.

#### *Conclusions/Impairment*

No special status species including threatened or endangered species or their critical habitats, are known on the sites. No impairment of special status species would occur under any alternative.

## ***Water and Wetlands***

### *NPS Policy:*

“The service will manage wetlands in compliance with NPS mandates and the requirements of Executive Order 11990 (Wetland Protection), the Clean Water Act, and the Rivers and Harbors Appropriation Act of 1899, and the procedures described in Directors Order 77-1: Wetland Protection.” (Management Policies 2001, section 4.6.5)

“The service will manage watersheds as complete hydrologic systems, and will minimize human disturbance to the natural upland processes that deliver water...” (Management Policies 2001, section 4.6.6)

### *Methodology:*

Alternatives were evaluated on the extent to which they conform to cited laws and policies, including whether more natural conditions would be created and whether the risk of unnatural large scale catastrophic watershed events would be reduced. Alternatives were also assessed to determine whether measures contained in the implementation standards would provide short-term wetlands protection during the work.

#### *A. No Action – Allow Fuels to Accumulate*

A small stream would intersect with the fuel buffer in each of the two project areas (see maps, Appendix A). No other wetland resources would be affected. Allowing fuels to accumulate subjects the existing streams to greater risk of unnaturally severe wildfire events. Damage could occur to the watersheds as a result of high intensity fire.

#### *B. Create Reduced Fuel Buffer through Mechanical Means*

A small stream would intersect the fuel buffer in each of the two project areas (see maps, Appendix A). No other wetland resources would be affected. Mechanical reduction of fuels in these project areas would reduce the risk of unnaturally severe wildland fire and attendant negative effects on the watershed. The use of vehicles in or around stream corridors would be prohibited during implementation. No surface soil disturbance would occur that would cause added sedimentation. Logs and other large woody debris over eight inches in diameter would remain in the streambed and on adjacent slopes. No increases in sedimentation or significant changes to other stream characteristics are expected. Alternative B would result in increased sun reaching the watercourse over the 200' width of the buffer. However, no adverse increases in temperature would be expected over the short reach affected by the project.

#### *C. Create Reduced Fuel Buffer using Prescribed Fire*

A small stream would intersect the fuel buffer in each of the two project areas (see maps, Appendix A). No other wetland resources would be affected. Reduction of fuels using prescribed fire in these projects areas would reduce the risk of unnaturally severe wildland fire and attendant negative effects on the watershed. The use of vehicles in or around stream corridors would be prohibited during implementation. Some large woody debris would be consumed during the prescribed fire event. Additional snags and woody debris would be created and contribute to the

stability of the stream course over time. Ash and bare ground exposed by the fire event would increase sedimentation in the first season following fire. Alternative C would result in increased sun reaching the watercourse over the 200' width of the buffer. However, no adverse increases in temperature would be expected over the short reach affected by the project.

### *Conclusions/Impairment*

Alternative A would result in an increasing risk and possible impairment of watershed properties in the event of a wildfire event. Alternatives B and C mitigate wildfire risk on a local level, and create conditions conducive to restoration of fire in the remainder of the respective watersheds. While both B and C would alter local conditions to some extent, the conditions created would be more natural than the current conditions and would not result in resource impairment.

## ***Cultural Resources***

### *NPS Policy:*

"The National Park Service will preserve and foster appreciation of the cultural resources in its custody... The cultural resource management policies of the NPS are derived from a suite of historic preservation, environmental, and other laws, proclamations, Executive orders, and regulations" [including the Archaeological Resources Protection Act of 1979] (Management Policies 2001, section 5)

"Planning decisions will follow analysis of how proposals might affect the values that make resources significant, and the consideration of alternatives that might avoid or mitigate potential adverse effects." (Management Policies 2001, section 5.2)

### *Methodology:*

The park archeologist was consulted for an opinion regarding the potential effects of each alternative on cultural resources.

#### *A. No Action – Allow Fuels to Accumulate*

No direct effects on known cultural resources would occur as a result of this alternative.

#### *B. Create Reduced Fuel Buffer through Mechanical Means*

The proposed Mineral King Road historic landscape intersects with the project work at Silver City. The proposed work would not adversely affect any qualities or resources associated with the historic landscape. The proposed work may serve to restore a more historic appearance around Silver City. A 100% survey of the project sites would occur to detect unknown cultural resources prior to work. Any cultural resources detected would be avoided or fully mitigated to standards established by the park Archeologist prior to work being implemented.

#### *C. Create Reduced Fuel Buffer using Prescribed Fire*

The proposed Mineral King Road historic landscape intersects with the project work at Silver City. The proposed work would not adversely affect any qualities or resources associated with the historic landscape. The proposed work may serve to restore a more historic appearance

around Silver City. A 100% survey of the holding lines that would be developed to implement the prescribed burns would occur to detect unknown cultural resources. Any cultural resources detected would be avoided or fully mitigated to standards established by the park Archeologist prior to work being implemented.

### *Conclusions/Impairment*

No identified cultural resources would be impaired under any alternative. Surveys would be conducted prior to implementing Alternatives B and C. Newly discovered cultural resources would be avoided or mitigated according to standards established by the park Archeologist.

### ***Wilderness***

#### *NPS Policy:*

NPS wilderness policy conforms with requirements of the Wilderness Act of 1964. Elements of NPS wilderness policy found in *NPS Reference Manual 41 – Wilderness Preservation and Management* (RM-41) germane to lands that may now be in wilderness at the Oriole Lake project site include;

“By including lands that had previously been clearcut or had abandoned roads, Congress implied that wilderness did not have to consist solely of pristine old-growth forests, and that lands previously disturbed could be rehabilitated to meet wilderness standards and qualities” (RM-41, Section II E.)

“Lands that have been logged, farmed, grazed, mined, or otherwise utilized in ways not involving extensive development or alternation of the landscape may also be considered suitable for wilderness designation if, at the time of assessment, the effects of these activities are substantially unnoticeable or their wilderness character could be maintained or restored through appropriate management actions.

An area will not be excluded from a determination of wilderness suitability sole because established or proposed management practices require the use of tools, equipment, or structures, if those practices are necessary to meet the minimum requirements for the administration of the area as wilderness.” RM-41, Section 6.2.1.

RM-41 (Section 6.3.7) also states that “Management intervention [in wilderness] should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and the influences originating outside of wilderness boundaries.”

#### *Methodology:*

The Land Protection Plan for the Oriole Lake area indicates that acquired lands should be restored prior to inclusion in wilderness by stating that “[t]he management objective for Oriole Lake is to restore the area to natural conditions and add it to the designated wilderness of these Parks.” NPS Policy allows restoration of disturbed lands in wilderness where deemed



appropriate. The alternatives were evaluated for consistency with the Land Protection Plan for the area, and conformity with NPS policy.

*A. No Action – Allow Fuels to Accumulate*

Fire management actions aimed at restoring natural conditions in adjacent wilderness areas would be hampered by the lack of adequate fuel treatment around private developments. Fuel and forest structure conditions on the project sites would continue to develop toward unnatural loads and densities.

*B. Create Reduced Fuel Buffer through Mechanical Means*

Up to 8.4 acres of the proposed project may be located in designated wilderness at Oriole Lake. Creation of the reduced fuel conditions around the developments would facilitate the safe reintroduction of fire and eventual restoration of more natural conditions in surrounding NPS wilderness. The conditions created as a result of the project would result in an area that more closely resembles natural conditions. No vehicles would be used within the wilderness, however mechanized saws are proposed for cutting fuels and trees. A minimum tool analysis would be prepared prior to implementation of any work. No proposed or designated wilderness areas occur at the Silver City project site.

*C. Create Reduced Fuel Buffer using Prescribed Fire*

Up to 8.4 acres of the proposed project may be located in designated wilderness at Oriole Lake. Creation of the reduced fuel environment around the developments would result in conditions favorable to the reintroduction of fire and eventual restoration of more natural conditions in the surrounding NPS wilderness. The conditions created by the project would result in an area that would closely resemble desired natural conditions. No vehicles would be used within the wilderness, however mechanized saws may be used to cut fuels and trees necessary to develop firelines to control the prescribed fire activity. A minimum tool analysis would be prepared prior to implementation of any work. No proposed or designated wilderness areas occur at the Silver City project site.

*Minimum Requirement*

The park does not have an approved Wilderness Management Plan at this time. Therefore, this environmental assessment will serve as the vehicle for determining the minimum requirement for the proposed project. The minimum requirement will be considered the alternative selected for implementation.

*Minimum Tool*

The park assessed the minimum tool requirement for the preferred alternative only (Table 1). The other two alternatives would either not require the application of any tool (Alternative A – No Action), or would not require the use of tools outside of those specified under the parks Fire Management Plan to construct fire line (Alternative C – Prescribed Fire). If this assessment results in the selection of the preferred alternative, this evaluation will stand as the approval for the use of chainsaws as the minimum tool.

**Table 1. Minimum tool analysis for Alternative B. Mechanical Treatment (Preferred Alternative)**

<b>Factor</b>	<b>Mechanical tools - Chainsaws</b>	<b>Hand tools only</b>
<b>Efficiency:</b>  The duration of the project has direct implications for cost, safety, and impacts to resources, residents, and visitors. A shorter duration project reduces the impact of all factors.	The project is expected to take up to 6 weeks with a 20 person crew running up to 4 saws. Four staff would be providing safety for the sawyers, with the remaining 8 workers would be moving and piling fuels for later burning.	The project is expected to take 24 weeks with a 20 person crew running up to 4 falling axes and 5-10 limbing/brushing/bucking saws and axes. The additional 5 staff would be brushing, moving, and piling fuels for later burning.
<b>Aesthetics:</b>  Natural appearance can be better maintained by flush cutting all stumps.	Chainsaws are adept at cutting stumps and stubs low to the ground where they are less of a visual impact.	Flush cutting would not be accomplished. The visual impacts of the project would be longer lasting and higher visibility.
<b>Cost:</b>  Personnel costs comprise approximately 85% of project expenditures.	Fuel reduction using chainsaws costs \$1,700 per acre on average.	Fuel reduction using only hand tools costs \$6,800 per acre on average.
<b>Safety:</b>  <u>Road travel</u> The Mineral King access road is a steep, winding, narrow mountain road. Daily driving presents significant risk of accidents, particularly at days end when workers are tired.	The project would take approximately 6 weeks to complete. Exposure to hazardous mountain driving conditions would occur during those times. No alternatives exist for lodging or camping in the vicinity.	The project would take approximately 24 weeks to complete, with daily travel on the Mineral King road required. The risk to workers would be substantially higher due to the increased number of days of road travel.
<u>Steep terrain</u> Significant portions of the project work will occur on steep slopes (greater than 100%).	Caution would be required in carrying and operating up to four chainsaws. Using a chainsaw, footing and stance are generally stable and easily maintained. A second person (swamper) would accompany each sawyer to assure proper stance, balance, and safety.	Caution would be required in carrying and operating numerous sharp hand tools on steep slopes. The need to swing axes and/or operate handsaws on steep slopes creates opportunities for loss of balance and increased injury.

<b>Factor</b>	<b>Mechanical tools - Chainsaws</b>	<b>Hand tools only</b>
<p><u>Canopy and vegetation closure</u> The dense understory of shrub and tree reproduction in many areas results in limited clearance for cutting around and between target vegetation and fuels.</p>	<p>Chainsaws are adept at safely cutting and clearing fuels with small clearances and no swing room requirements.</p>	<p>Hand tools may require more clearance for access and swing-clearance (in the case of axes). Limited clearance would hinder safety when manipulating sharp tools at close quarters.</p>
<p><b>Impact on wilderness values:</b></p> <p><u>Noise</u> Sources of noise may come from crew vehicles on access roads, crew communications (voice and handheld radio), and tool use (axes/saws and/or chainsaws).</p>	<p>A 20-person crew and chainsaws would create substantial noise over the course of 6 weeks. Work would be constrained to non-holiday weekdays to minimize noise impact to visitors and cabin owners.</p>	<p>A 20-person crew would create substantial noise over 24 weeks. Noise would be of primarily human origin rather than mechanical. Work would be constrained to non-holiday weekdays to minimize noise impact to visitors and cabin owners.</p>
<p><u>Collateral Resource Impacts</u> To access the sites, crews will be walking in from roads, compacting soils and creating trailing in the course of events. Fewer trips to the project area will result in less compaction and erosion. With no sanitary facilities in the area, human waste will need to be carefully managed consistent with standard wilderness practices. Fewer workdays would result in less human waste.</p>	<p>Crews would be in the project area for 6 weeks. Given the efficiency of chainsaws to fell, limb, and buck up fuels in a single pass, less trampling and compaction would occur. Crews would require fewer trips to access the project sites, reducing trailing and compaction. Less human waste would be generated.</p>	<p>Crews would be in the project area for 24 weeks. Given the multiple processes and tools needed to fell, limb, and buck up fuels, much more trampling and compaction would occur. Crews would require multiple trips to access the project sites, increasing trailing and compaction. Four times the amount of human waste would be generated.</p>
<p><u>Disruption of Visitor use</u> The Oriole Lake project area receives few visitors exclusive of cabin owners and their guests. Though accurate records do not exist for this area, estimates are that fewer than 50 visitors use the area each year. No public roads or trailheads access the area. Under either alternative, few visitors would be directly affected. No roads or trails would be closed to public access during the work.</p>	<p>Few visitors would be affected. Cabin owners usually are present primarily on weekends. To minimize impacts to cabin owners and visitors, work would be conducted during the usual workweek.</p>	<p>Few visitors would be affected. Cabin owners usually are present primarily on weekends. To minimize impacts to cabin owners and visitors, work would be conducted during the usual workweek.</p>

*Conclusion - Minimum tool*

The use of chainsaws in designated wilderness at Oriole Lake is considered the minimum tool for the preferred alternative. Due to numerous site factors, using hand tools alone is impractical for completing the work in an effective, safe, and low impact manner. The use of chainsaws for this project will serve to increase worker safety, decrease the duration and extent of resource and wilderness impacts, and result in a more aesthetically appropriate result with little evidence of human intervention. At approximately one-fourth the cost of a similar operation using hand tools alone, the use of chainsaws for this project also represents the most cost effective method of achieving important resource management goals.

#### *Conclusion – Resource Impairment*

Alternative A retains unnatural resource conditions within a wilderness area at Oriole Lake. Alternatives B and C would result in direct restoration of more natural conditions in approximately eight acres of wilderness. These actions are consistent with the Land Protection Plan direction and are within the scope of actions allowed under NPS wilderness policy. Alternatives B and C would also result in reduced fuel environments around non-wilderness developments creating conditions more conducive to the reintroduction of fire and restoration of natural conditions in the adjacent NPS wilderness. No vehicles would be allowed in the wilderness area. It is expected that the proposed work would create only transient and short-term audible impacts. Therefore, it is determined that Alternatives B and C would not result in impairment of the wilderness resource.

#### *Air Quality*

##### *NPS Policy:*

“The NPS has a responsibility to protect air quality under both the 1916 Organic Act and the Clean Air Act.” (Management Policies 2001, section 4.7.1)

##### *Methodology:*

The effects of each alternative on park and regional air quality and air quality related values were evaluated by staff subject matter experts.

##### *A. No Action – Allow Fuels to Accumulate*

No impacts to air quality would occur.

##### *B. Create Reduced Fuel Buffer through Mechanical Means*

Short duration air quality impacts in localized areas would occur as a result of burning residual piles of fuel. All burning would be conducted in strict conformity with the requirements of the San Joaquin Valley Unified Air Pollution Control District. Pile burning would occur after Labor Day or before Memorial Day to minimize the numbers of visitors and residents exposed to smoke.

##### *C. Create Reduced Fuel Buffer using Prescribed Fire*

Short duration air quality impacts in localized areas may occur as a result of the prescribed burning. All burning would be conducted in strict conformity with the requirements of the San

Joaquin Valley Unified Air Pollution Control District. Burning would occur after Labor Day or before Memorial Day to minimize the numbers of visitors and residents exposed to smoke.

#### *Conclusions/Impairment*

No impairment of air quality would occur as a result of any alternative. Short-term transient impacts to local air quality would occur during pile burning or broadcast burning. Local effects would be mitigated through timing of the burns at times when few summer residents, employees, or park visitors are present, and through strict conformity with state and local air quality requirements.

#### ***Recreation***

##### *NPS Policy:*

“Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks.” (Management Policies 2001, section 8.2)

“Congress, recognizing that the enjoyment by future generations of the national parks can be ensured only if the superb quality of park resources and values is left unimpaired, has provided that when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant” (Management Policies 2001, section 1.4.3)

##### *Methodology:*

Alternatives were evaluated to assess disruption of permissible visitor activities.

##### *A. No Action – Allow Fuels to Accumulate*

No impacts to recreational use would occur.

##### *B. Create Reduced Fuel Buffer through Mechanical Means*

Recreational use in the project areas includes residents of the private structures, and other park visitors to the Silver City area. Short-term transient impacts to recreational use may occur as the result of noise from saws and the presence of workers in the area. Project areas may be closed for a short duration (1 hour to 1 week) to facilitate safe operations. Long-term benefits would include a more natural appearing and functioning environment with fewer hazards.

##### *C. Create Reduced Fuel Buffer using Prescribed Fire*

Recreational use in the project areas includes residents of the private structures, and other park visitors to the Silver City area. Short-term transient impacts to recreational use may occur as the result of noise from saws and the presence of firefighters in the area. Project areas may be closed for a short duration (1 hour to 1 week) to facilitate safe operations. Long-term benefits would include a more natural appearing and functioning environment with fewer hazards.

#### *Conclusions/Impairment*

No impairment to recreational use would occur as a result of any alternative. Alternatives B and C would create short-term transient impacts to recreational use as the result of noise from saws and the presence of workers in the area. Project areas would be closed for short duration (1 hour to 1 week) to facilitate safe operations. Long-term benefits would include a more natural appearing and functioning environment with fewer hazards.

### **Cumulative Effects and Linked Efforts**

Alternative A would continue unnatural fuel and forest structure conditions on the project sites. More significantly, while such conditions exist adjacent to private lands and developments, efforts to safely restore natural conditions through the restoration of fire on adjacent NPS lands would be curtailed or severely hampered due to the risk to developments resulting in cumulative negative effects over time.

Alternatives B and C would facilitate the restoration of fire to larger areas of the parks as described in the parks approved Fire Management Plan. To the extent that the proposed actions promote the ability of the park to restore fire as a natural process on a larger scale, they may be viewed as a component of a larger plan having cumulative beneficial effects on park resources.

The current Fire Management Plan is undergoing a full revision and will be completed within the next year. While that planning effort continues, the actions proposed in this EA would be implemented separately to provide immediate protection from unwanted wildland fire and promote restoration of beneficial fire at the project locations. Implemented separately from the Fire Management Plan, the proposed actions would continue to have both resource and public safety benefits as described above, regardless of whether the revised Fire Management Plan was fully implemented.

Alternatives B and C are not expected to have any cumulative negative effects on the environment whether implemented separately or in conjunction with the park-wide Fire Management Plan.

## Impact Summary Matrix

	<b>Alternative A</b> <i>No Action: Allow Fuels to Accumulate</i>	<b>Alternative B</b> <i>Create Reduced Fuel Buffer through Mechanical Means</i>	<b>Alternative C</b> <i>Create Reduced Fuel Buffer using Prescribed Fire</i>
Public & Firefighter Safety	-	+	+
Ecological Function	-	+	+
Aesthetics	0	0	0
Special Status Species	0	0	0
Water & Wetlands	-	+	+
Cultural Resources	0	0	0
Wilderness	-	+	+
Air Quality	0	0	0
Recreation	0	0	0
Cumulative Effects	-	+	+

+ = Positive effect

- = Negative effect

0 = Neutral or no effect

**Mitigation Matrix for Alternative B. - *Create Reduced Fuel Buffer through Mechanical Means***

<b>Resource Value</b>	<b>Mitigation</b>
Public and Firefighter Safety	<p>Implementation of the reduced fuel buffers would be carefully planned and conducted with full consideration of public safety. Project areas would be closed for short durations (1 hour to 1 week) to provide for safety during felling and clearing operations and during pile burning. Closures would be coordinated with Silver City Resort and other residents to minimize conflicts.</p> <p>Trees and snags to be removed would be felled away from private property and structures.</p> <p>Firefighter safety would be high priority and would be stressed through adherence to the standard firefighting orders and the use of full personal protective equipment at all times.</p> <p>A job hazard analysis would be conducted prior to any work, and all usual and customary safety practices would be implemented to insure safety of workers.</p>
Ecological Function	<p>The specifications for the reduced fuel buffer will result in fuel and forest canopy conditions closely resembling those desired for restoring natural conditions.</p> <p>The creation of a defensible buffer will allow future implementation of more widespread restoration of fire as an ecosystem process on adjacent NPS lands.</p>
Aesthetics	<p>High fuel levels and dense thickets of trees would be reduced to natural levels.</p> <p>These conditions create a more open understory, a condition that is also attractive to many residents and visitors.</p> <p>The developed areas will blend more seamlessly into the natural environment more readily.</p> <p>Stumps will be flush cut and cut ends of logs will be treated to reduce visibility.</p>
Special Status Species	No special status wildlife or plant species would be affected.
Water and Wetlands	<p>The use of vehicles in or around stream corridors would be prohibited. No soil disturbance would occur.</p> <p>Logs and other large woody debris over eight inches in diameter</p>



Resource Value	Mitigation
	would remain in the streambeds and throughout the project area.
Cultural Resources	A 100% survey of the project sites would occur to detect unknown cultural resources. Any cultural resources detected would be avoided or fully mitigated to standards established by the park Archeologist prior to work being implemented.
Wilderness	<p>No vehicles would be used within the wilderness at Oriole Lake.</p> <p>The conditions created by the project would result in an area that will more closely resemble natural conditions.</p> <p>Creation of the reduced fuel buffer around the developments will result in conditions favorable to the reintroduction of fire and restoration of more natural conditions in the surrounding NPS wilderness areas.</p>
Air Quality	<p>Air quality impacts in localized areas would occur as a result of the prescribed burning.</p> <p>All burning would be conducted in strict conformity with the requirements of the San Joaquin Air Pollution Control District.</p> <p>Burning would occur after Labor Day or before Memorial Day to minimize the numbers of visitors and residents exposed to smoke.</p>
Recreation	<p>Project areas may be closed for short duration (1 hour to 1 week) to facilitate safe operations. Closures will be effected for the minimum amount of time necessary for safe operations. No public roads or trails will be closed.</p> <p>Areas will be restored to more natural appearance and function, enhancing the recreational experience.</p>

## Consultation and coordination

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Sylvia Haultian – Plant Ecologist  
Harold Werner – Wildlife Biologist  
John Austin – Natural Resource Planner  
Tom Burge – Archeologist  
Residents and property owners of Silver City and Oriole Lake.

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